

In this thesis, we study electrical and optical properties of ZnO single crystals, by processing measurements of Hall effect to low temperatures. We also research how defects influence ZnO single crystal in terms of its electrical properties. We studied donors and acceptors levels in this material and their activation energies. We try to find what cause these donors and acceptors. We characterized material with its electrical conductivity, carrier concentration and carrier mobility. We carry an experiment of annealing ZnO in vapor of Zn, while we are looking for a change in mobility and a change in defect structure. As well we process photoluminescence measurement, the ZnO was excited with 355nm laser - light energy higher than the bandgap. We see green luminescence and its shift towards blue part of the spectra after annealing the crystals in ZnO vapor.